Astrophysics Research And Analysis

Cosmic Ray Energetics And Mass (CREAM) launch and operations, PSU Co-I

Completed Technology Project (2016 - 2021)

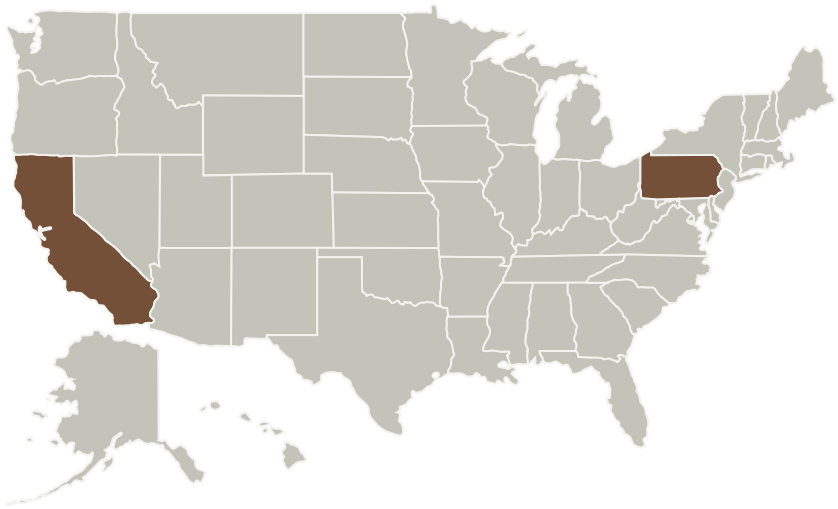
Project Introduction

This proposal covers the activities of the Penn State group on the BACCUS high-altitude balloon experiment in Antarctica and on the CREAM mission to the ISS. These projects together will achieve definitive measurements of the cosmic-ray elemental spectra into the PeV range (nuclei) and of cosmic-ray electrons into the TeV range, as well as detailed studies of secondary nuclei (such as B or the sub-Fe elements). These are the experimental measurements needed to sort out the details of cosmic-ray acceleration and propagation in the Galaxy, a long standing puzzle in particle astrophysics.

Anticipated Benefits

The Astrophysics Research and Analysis program (APRA) supports suborbital and suborbital-class investigations, development of detectors and supporting technology, laboratory astrophysics, and limited ground based observing. Basic research proposals in these areas are solicited for investigations that are relevant to NASA's programs in astronomy and astrophysics, including the entire range of photons, gravitational waves, and particle astrophysics. The emphasis of this solicitation is on technologies and investigations that advance NASA astrophysics missions and goals.

Primary U.S. Work Locations and Key Partners



Primary U.S. Work Locations	
California	Pennsylvania

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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Responsible Program:

Astrophysics Research and Analysis

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Project Management

Program Director:

Michael A Garcia

Program Manager:

Dominic J Benford

Principal Investigator:

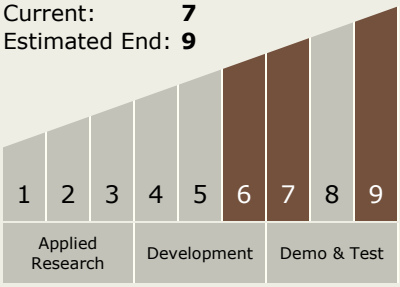
Stephane Coutu

Co-Investigators:

Isaac Mognet
Megan F Meinecke

Technology Maturity (TRL)

Start: **6**
Current: **7**
Estimated End: **9**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

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Target Destination

Outside the Solar System